

The Health of Ocean and Coastal Waters

Coastal and Oceans Month--January 2003

Year of Clean Water 2002-2003



Outline

- Oceans and Coasts
- Actions
- Problems
- Remaining Challenges
- Take Home Message



Oceans and Coasts

- Provide recreational opportunities.
- Create one out of every 6 jobs in the US.
- Provide habitat for 75-90% commercial and recreational fish catch.
- Provide aesthetic value.
- Have 180 million Americans visit every year: \$600 billion annually.

Actions

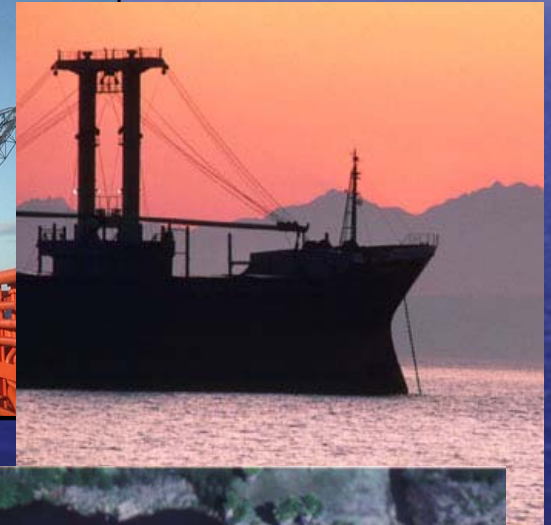
- Clean Water Act – 1970
- Marine Protection, Research, and Sanctuaries Act – 1972
- Coastal Zone Management Act - 1973
- Ocean Dumping Ban Act - 1988 - Stopped dumping of industrial waste & sewage sludge
- London Convention - 1972 - Controls ocean dumping of wastes
- MARPOL Treaty - Controls vessel discharges
- Basel Convention - Transboundary movement of wastes

Actions

- Drastic reductions in industrial and municipal pollution.
- Today--170 million people are served by sewage treatment. 1970--85 million.
- Industries installed best available technologies-removing billions of pounds of pollutants from their wastewater.
- The loss of wetlands has slowed.

Problems

- ô **Habitat loss**
- ô **Nutrient pollution**
- ô **Toxic chemicals**
- ô **Pathogens**
- ô **Altered water flow**
- ô **Invasive species**
- ô **Marine debris**
- ô **Unsustainable fishing**
- ô **Health of Coral Reefs**



Habitat Loss



Coastal areas provide habitat for 45% of endangered/threatened species and 50% of non-game migratory birds.

Causes:

- Residential, agricultural and commercial development
- Alteration of water flows (dams, levees, filling of wetlands)
- Shoreline stabilization structures (sea walls, bulkheads, jetties)
- Impacts from certain fishing practices (trawling, long lining)

Effects:

- Declines in fish and wildlife populations
- Increased risk to threatened and endangered species
- Reduced biodiversity (number of species)
- Reduced commercial fish catches
- Reduced opportunities for recreation, education, and tourism

Coastal Habitats



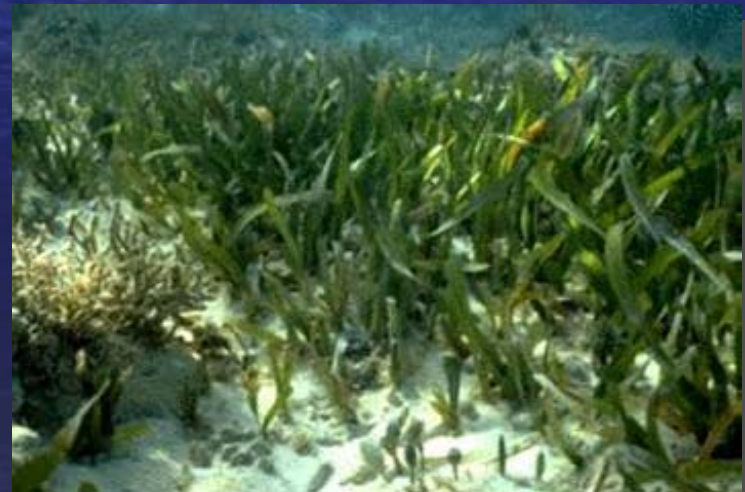
rocky shores



marshes



sandy



underwater grasses



**Estuaries are
home to many
kinds of plants
and animals.**



Nutrient Pollution

Causes:

- Agricultural runoff (fertilizers and animal wastes)
- Urban and suburban runoff
- Sewage treatment plants
- Septic systems
- Deposition of air pollutants on land and water



Effects:

- Stimulates harmful algal blooms
- Reduces water clarity
- Reduces oxygen in the water
- Negative impacts on fish, shellfish, sea-grasses
- Economic losses from reduced fish catches and lost tourism
- 2/3 of estuaries in U.S. are eutrophic



Non-Point Sources of Pollutants

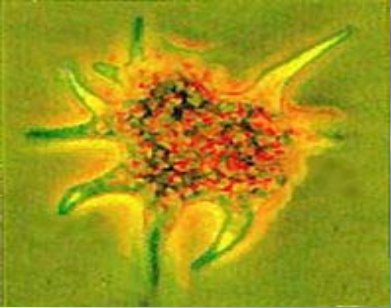


The Dead Zone in the Gulf of Mexico

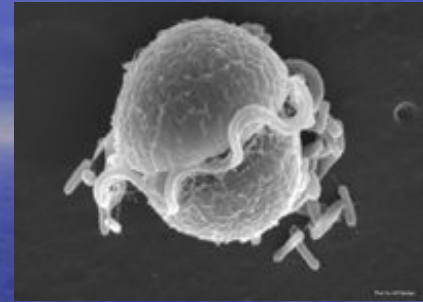
- Large Zone of Hypoxia - not enough oxygen to support fish and other organisms
 - Size ranges from 3000 to 8000 sq. mi. off the northern coast of the Gulf of Mexico
- Primarily caused by:
 - Nitrogen over-enrichment from the Mississippi & Atchafalaya Rivers
 - Physical changes to the Mississippi & Atchafalaya Rivers
- Problem is not unique to the Gulf of Mexico

Pfiesteria

- Killed over a billion fish in late 1990s.
- Present in sediments from New Jersey to Texas.
- Human health impacts: short term memory loss, confusion, cognitive impairment



Amoeba Stage



Zoospore Stage



Red Tide



Toxic Chemicals

Causes:

- Urban/suburban runoff (oil, paints, lawn-care products, household chemicals, metals)
- Agricultural runoff (pesticides)
- Atmospheric deposition (e.g., waste incineration, fuel combustion)
- Oil spills
- Industrial and municipal discharges
- Vessel discharges

Effects:

- Toxic to fish and wildlife
- Human health risks from swimming and eating contaminated shellfish
- Economic losses from closed shellfish beds and lost tourism



Extent of Toxics Problem in the U.S.

- Total of 2800 fish advisories in 48 states, DC, and American Samoa.
- 23% of the Nation's total lake acres or over 63,000 lakes.
- 9% of the Nation's total river miles or over 325,000 river miles.
- 70% of the Nation's contiguous coastal waters including 90% of the Atlantic coast and 100% of the Gulf coast.
- 100% of the Great Lakes.

Number of Coastal Fish Consumption Advisories



Listing of Fish and Wildlife Advisories



Getting Started

Advisory Information

Comments

Contacts

Listing of Fish and Wildlife Consumption Advisories

(This application requires version 4.0 or higher of Internet Explorer and Netscape.)

The database, Listing of Fish and Wildlife Advisories (LFWA), is on line. This database includes all available information describing state-, tribal-, and federally-issued fish consumption advisories in the United States for the 50 States, the District of Columbia, and four U.S. Territories, and in Canada for the 12 provinces and territories. The database contains information provided to EPA by the states, tribes, territories and Canada.

The inclusion of information provided by states, tribes, territories and Canada does not imply any official EPA endorsement. Furthermore, EPA does not accept any responsibility for the data provided by these entities or guarantee the validity of this data.

For an overview of the U.S. data contained in the LFWA, [download the NLFWA Fact Sheet \(PDF, 159K\)](#).

Pathogens

Causes:

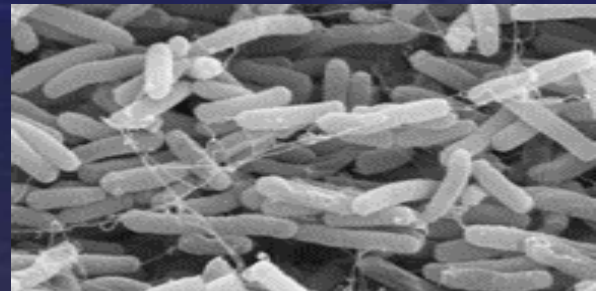
- Sewage treatment plant discharges
- Septic systems failure
- Agricultural runoff (animal waste)
- Urban and suburban runoff (waste from pets and wildlife)
- Improper disposal of waste from boats



Storm-water runoff from streets and parking lots carries bacteria that can cause illness. A study of swimmers in Santa Monica Bay found a 50% greater risk of illness for those who swam near flowing storm drains compared to those who swam further away.

Effects:

- Human health risks from swimming and eating contaminated fish or shellfish
- Economic losses from closed beaches and shellfish beds, and lost tourism

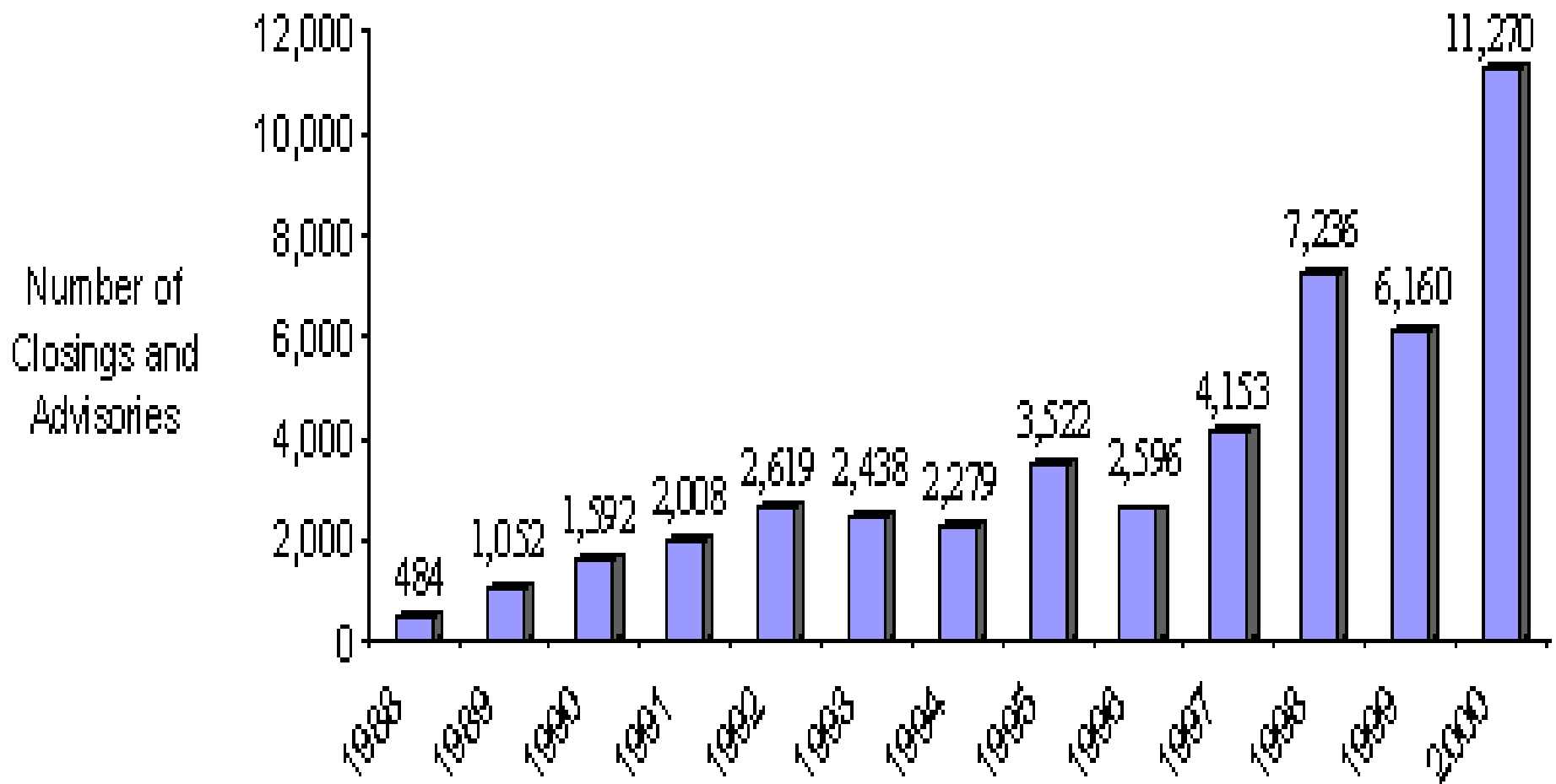




- 30% of coastal and Great Lake beaches closed or had an advisory at least once in 1999



Beach Closures

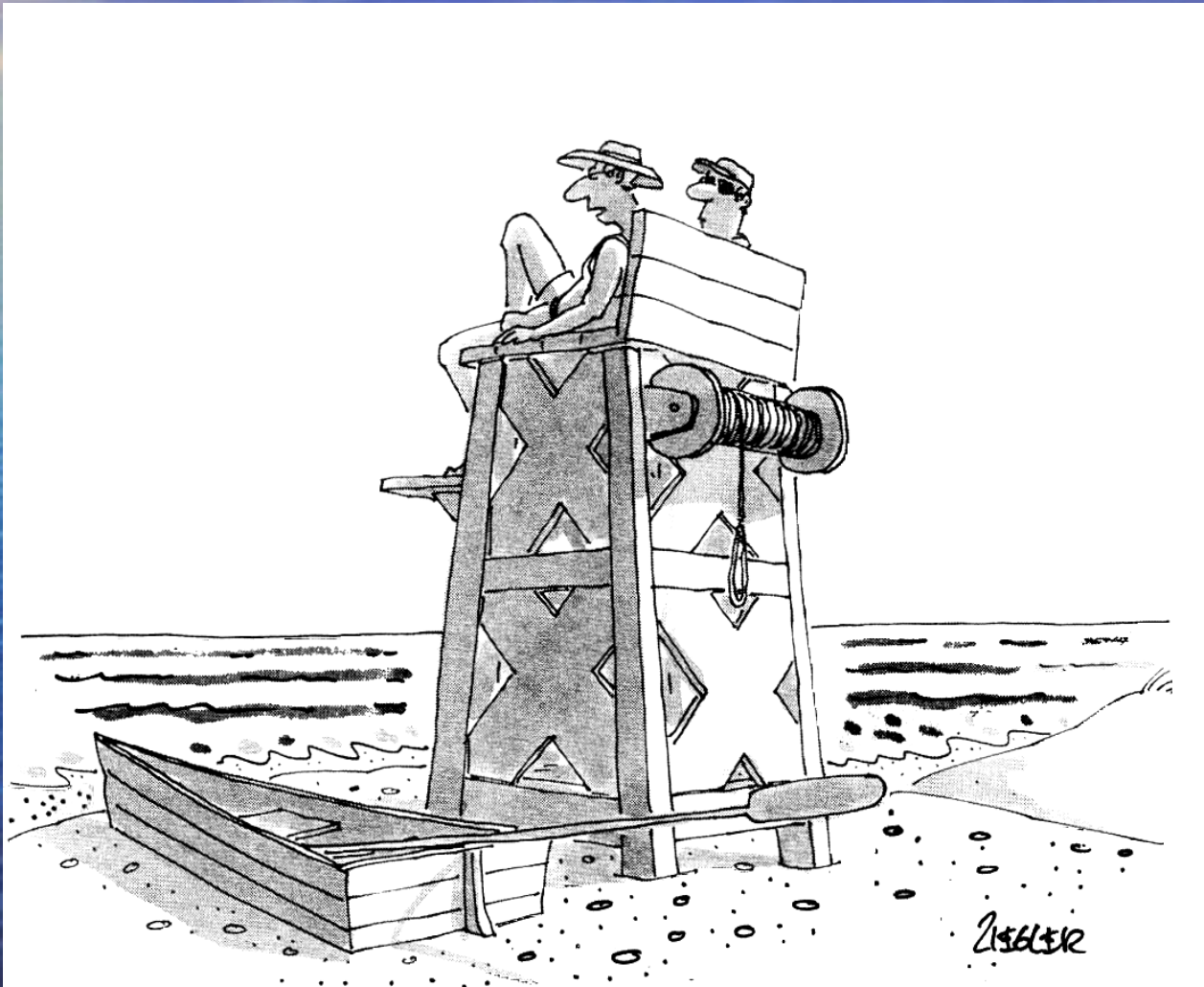


What is the health problem?



Not!!

What is the health problem? Another Perspective...



"I adore the beauty and tranquillity of these raw-sewage days."

Invasive Species

Causes:

- Accidental transport of non-native aquatic creatures in ship ballast water
- Accidental transport of plant seeds or shoots
- Deliberate introductions for ornamental use or to control native pests

Effects:

- Competition with and predation on native species
- Introduction of new diseases to native plants and animals
- Damage to native habitats
- Reduced biodiversity
- Economic impacts from damaged infrastructure and reduced fish catches



Impacts of Invasive Species



Northern Pacific Seastar

- Invasives are second most important threat to global biodiversity after habitat loss
- U.S. economic losses from control costs attributable to invasives exceed \$140 Billion/year
- San Francisco Bay is most invaded aquatic system in U.S.; it has about 240 known invasive species
- SF Bay: Asian Clam, Chinese Mitten Crab

Coral Reefs

- 10% of world's reefs degraded beyond recovery
- 30%: critical condition--may die in 10-20 years
- 30%: may perish by 2050



Threats to Coral Reefs

- 30%: may perish by 2050
- Pollution
- Over fishing & over exploitation
- Destructive fishing practices
- Dredging and shoreline modification
- Vessel groundings and anchoring
- Disease outbreaks
- Global climate change



Marine Debris

Causes:

- Littering on beaches and from boats
- Discarded fishing nets, lines, traps
- Garbage blown from trash cans and other sources
- Street runoff & CSOs

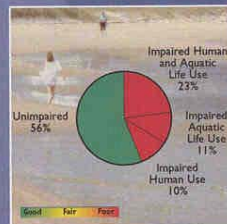


Effects:

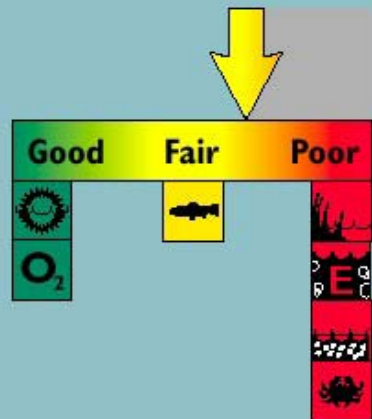
- Birds, sea turtles, and other wildlife die from entanglement or ingesting debris
- Chemical contamination from batteries, oil cans, and other types of debris
- Decreased recreational value of beaches and scuba-diving areas

The Ocean Conservancy found that cigarette butts, plastic, foam, and glass are the most prevalent types of marine debris.

National Coastal Condition Report



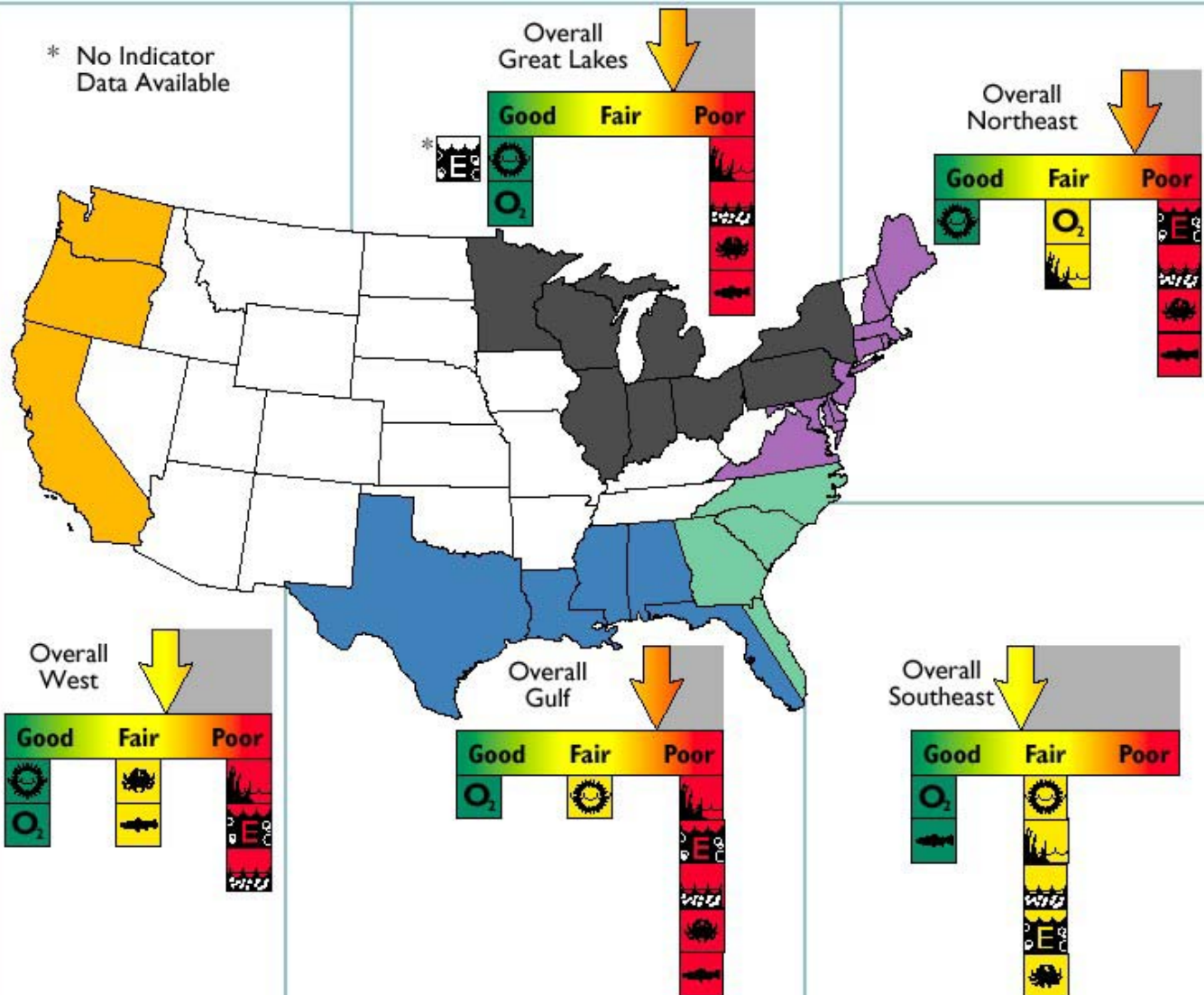
Overall National Coastal Condition



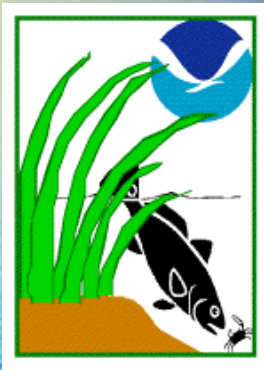
Ecological Health

- Water Clarity
- Dissolved Oxygen
- Coastal Wetlands
- Eutrophic Condition
- Sediment
- Benthos
- Fish Tissue

* No Indicator Data Available



Some of the Federal Programs That Address Coastal Issues



NOAA's National Estuarine Research Reserve System



National Coastal Assessment - Coastal 2000



CWAP: Coastal Research and Monitoring Strategy



National Estuary Program



National Marine Sanctuary Program



Environmental Monitoring and Assessment Program



NOAA National Status and Trends



U.S. Fish and Wildlife Service Coastal Program



Coastal Zone Management Act



EPA's BEACH Watch Program



EPA Great Waters Program



National Streamgauging Program

Remaining Challenges

- Past 30 years addressed the most visible issues.
- Next 30 years--Individually small but cumulatively enormous.
- Need a holistic/watershed approach—collaboration, partnerships and consensus building are critical to future successes





GRAND PRINCESS®



U.S. Capitol Building and Grand Princess shown same scale.

What Can You Do?

Everyday:

- 4 Conserve water
- 4 Don't be wasteful
- 4 Don't litter
- 4 Recycle
- 4 Choose non-toxic products

In your watershed:

- 4 Learn more about your watershed
- 4 Get involved with your local estuary program or watershed group
- 4 Become a volunteer monitor
- 4 Participate in trash clean-up days
- 4 Practice clean and responsible boating

At home:

- 4 Use minimal fertilizers and pesticides
- 4 Make sure your septic system is operating properly
- 4 Create wildlife habitat in your yard
- 4 Recycle used motor oil, dispose of household chemicals properly



Review Questions:

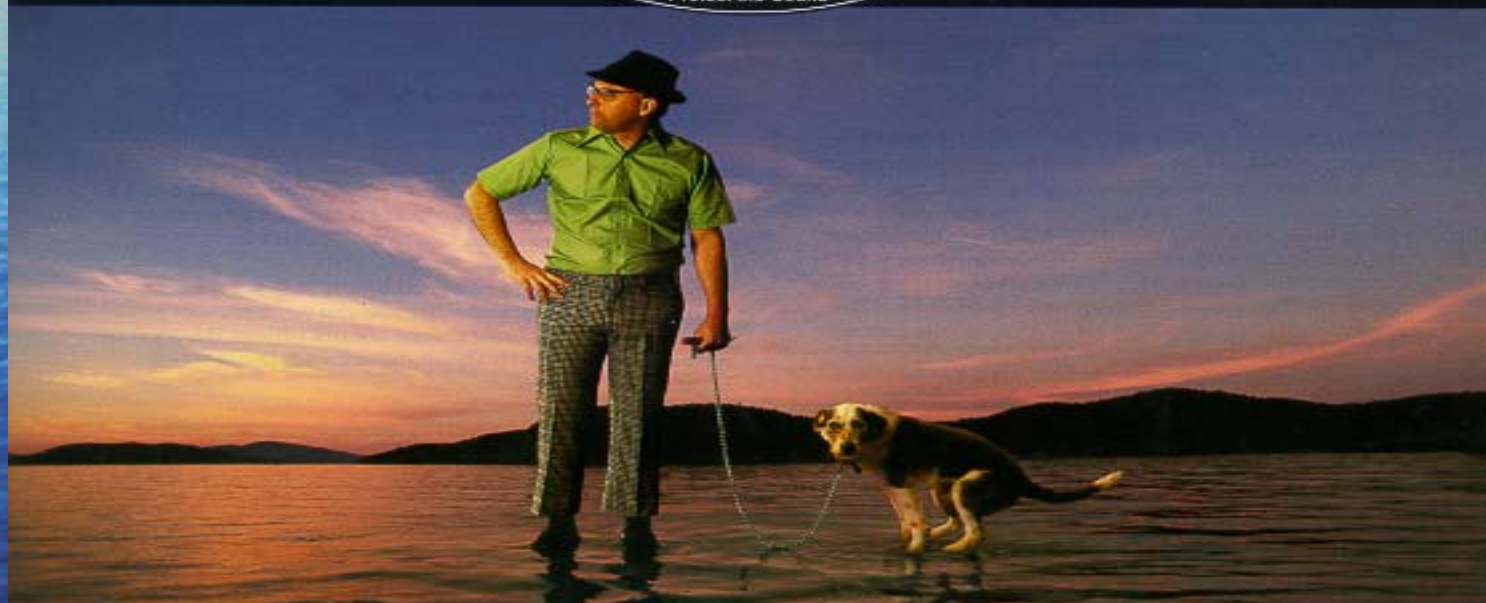
- 1. What message did you get out of this presentation?**
- 2. Do you recall the 9 major problems in ocean and coastal waters?**
- 3. Might you think of the following 4 slides when you think back on this presentation?**



WHEN YOUR PET GOES ON THE LAWN,

REMEMBER IT DOESN'T JUST

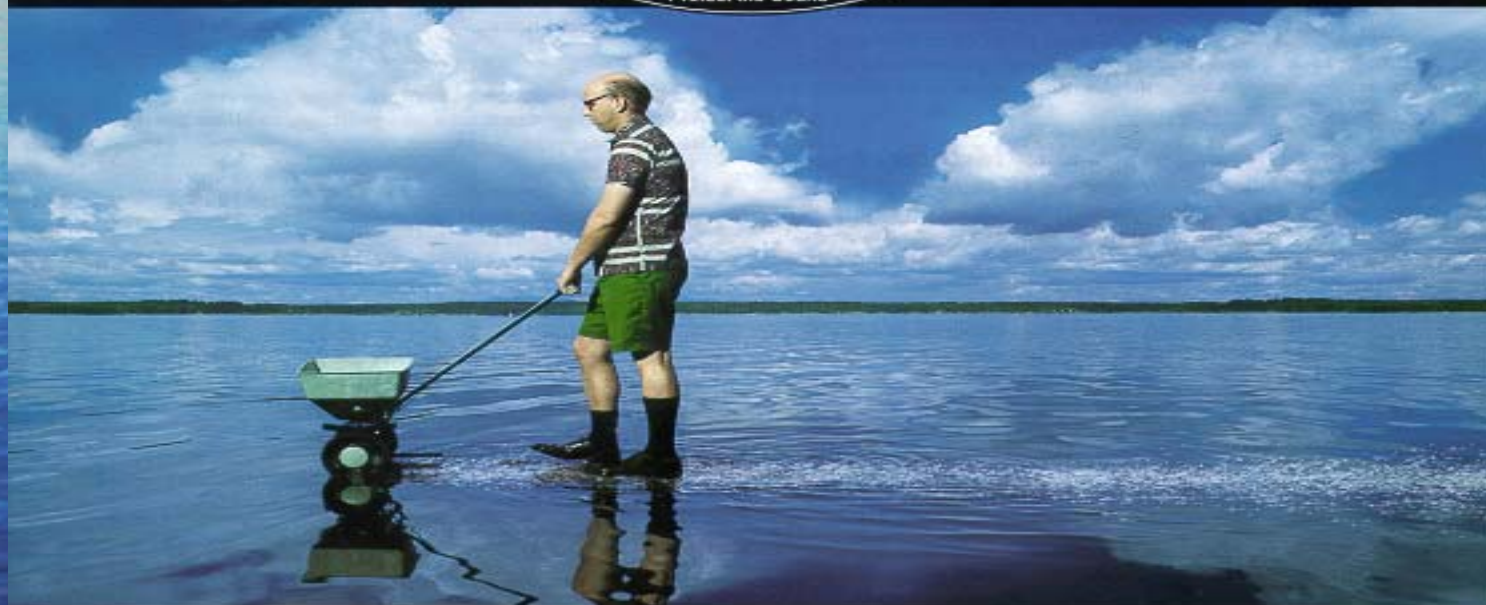
GO ON THE LAWN.



When our pets leave those little surprises, rain washes all that pet waste and bacteria into our storm drains. And then pollutes our waterways. So what to do? Simple. Dispose of it properly (preferably in the toilet). Then that little surprise gets treated like it should.

The Long Island Sound Study thanks the Westchester County (NY) Department of Planning and the Washington State Department of Ecology, King County, and the cities of Bellevue, Seattle and Tacoma. For more information, call (203) 977-1541 or (631) 632-9216 or visit the website www.epa.gov/region01/eco/lis.

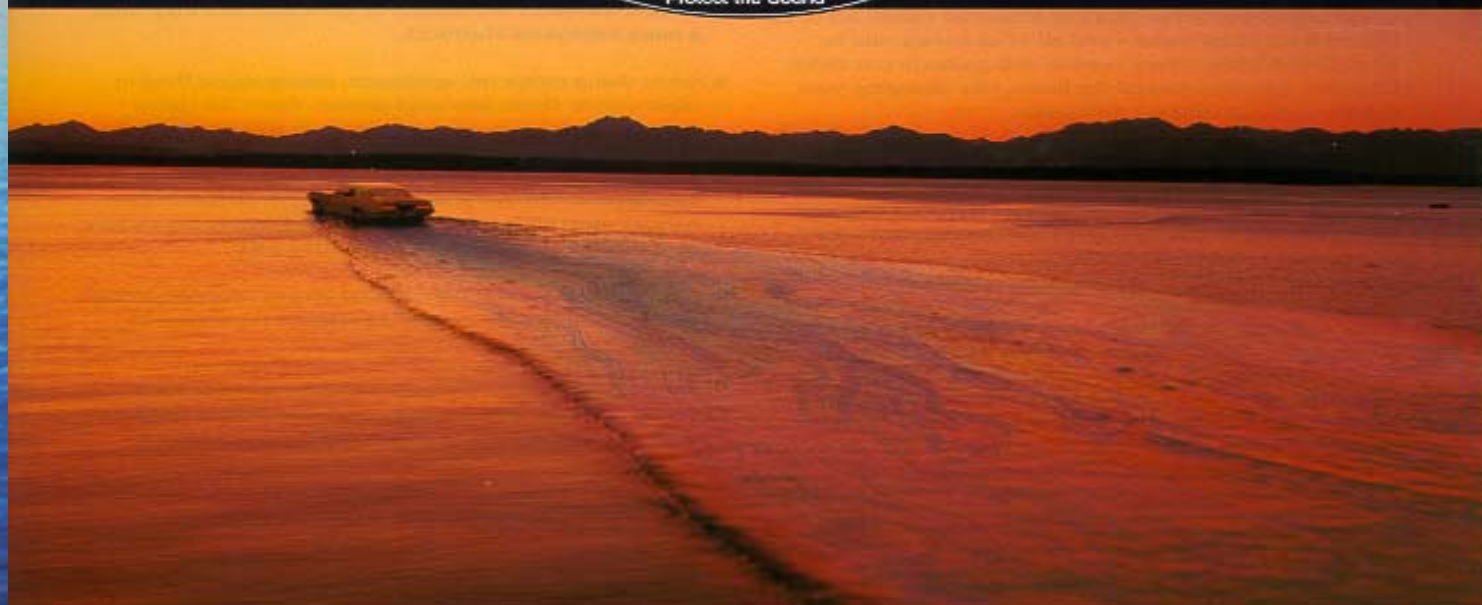
**WHEN YOU'RE FERTILIZING THE LAWN,
REMEMBER YOU'RE NOT JUST
FERTILIZING THE LAWN.**



**You fertilize the lawn. Then it rains. The rain washes the fertilizer along the curb,
into the storm drain, and directly into our lakes, streams and Long Island Sound.
This causes algae to grow, which uses up oxygen that fish need to survive.
So if you fertilize, please follow directions and use sparingly.**

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**WHEN YOUR CAR'S LEAKING OIL ON
THE STREET, REMEMBER IT'S NOT JUST
LEAKING OIL ON THE STREET.**



Leaking oil goes from car to street. And is washed from the street into the storm drain, and into our lakes, streams and Long Island Sound. Now imagine the number of cars in the area and you can imagine the amount of oil that finds its way from leaky gaskets into our water. So please, fix oil leaks.

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No Wetlands, No Seafood

